
Sequence Listing was accepted.

If you need help call the Patent Electronic Business Center at (866) 217-9197 (toll free).

Reviewer: Anne Corrigan

Timestamp: [year=2007; month=11; day=23; hr=14; min=4; sec=2; ms=838;]

Sequence Listing was accepted.

If you need help call the Patent Electronic Business Center at (866) 217-9197 (toll free).

Reviewer: Anne Corrigan

Timestamp: Fri Nov 02 16:26:37 EDT 2007

Validated By CRFValidator v 1.0.3

Application No: 10556014 Version No: 2.0

Input Set:

Output Set:

Started: 2007-11-02 12:02:07.200 **Finished:** 2007-11-02 12:02:09.416

Elapsed: 0 hr(s) 0 min(s) 2 sec(s) 216 ms

Total Warnings: 0

Total Errors: 0

No. of SeqIDs Defined: 47

Actual SeqID Count: 47

SEQUENCE LISTING

<110>	Chapp	e Research le, Clint Ramesh	n Foundatior	n			
<120>	REF1	Modified F	Plants and E	Plant Seeds			
<130>	PRF-1	0329					
<140>	10556	014					
<141>	2007-	11-02					
<160>	47						
<170>	Paten	tIn versio	on 3.3				
<210>	1						
<211>	1625						
<212>	DNA						
<213>	Arabi	dopsis tha	aliana				
<400>	1						
ccacgco	gtcc g	agagagaga	gagagaatta	caaagaaaaa	taaatggaga	acggcaaatg	60
caacgga	agcc a	cgacggtga	agttaccgga	gatcaaattc	accaagcttt	tcatcaacgg	120
ccagtto	catt g	atgctgctt	cagggaagac	gtttgagacg	atagacccta	ggaacggtga	180
agtgato	cgca a	caatagccg	aaggagacaa	agaagacgtt	gacttggccg	ttaacgctgc	240
acgttac	egee t	tcgaccatg	gtccttggcc	tcgcatgacc	ggcttcgaga	gggcaaagct	300
tataaad	caaa t	tcgcagact	taatagagga	aaacattgaa	gaattggcta	aacttgatgc	360
ggttgad	eggt g	gaaaattgt	tccaattggg	gaaatatgct	gatattccgg	ccacagccgg	420
tcatttt	cga t	acaatgcgg	gtgcagcgga	taaaatccac	ggcgagactc	ttaaaatgac	480
gcgtcaa	atcg t	tgtttggat	acaccctcaa	agaaccaatt	ggagtggttg	gtaatatcat	540
cccttgo	gaat t	tcccaagca	ttatgtttgc	cacaaaggta	gctccggcta	tggctgctgg	600
ttgcaco	catg g	tggtcaagc	cagctgaaca	gacttcactc	tctgctttgt	tctatgccca	660
tctctca	aaaa g	aagcgggaa	ttcctgatgg	tgtgctcaac	attgtaactg	gttttggatc	720
aactgct	gga g	ctgccattg	cctcccatat	ggacgtagac	aaagttagtt	tcactgggtc	780
aacagat	igtt g	gaaggaaga	taatgcaagc	cgcagccgca	agtaatctca	aaaaagtttc	840
ccttgaa	atta g	gcgggaaat	cgccacttct	catattcaac	gacgctgata	ttgacaaagc	900
cgccgat	ctt g	cgcttctcg	gttgctttta	caacaagggt	gaaatttgcg	tggcgagctc	960

tcgtgtgttt gttcaagaag gtatatacga taaggttgtg gagaagttag tagagaaggc 1020

taaagattgg	accgttggtg	atccttttga	ttccactgct	cgacaaggac	ctcaagtgga	1080
taaaagacag	tttgagaaga	ttctatctta	cattgagcac	ggtaaaaacg	aaggagcgac	1140
cttattaact	ggaggaaaag	ccattggaga	caaaggatat	ttcatccaac	caactatatt	1200
cgcagatgtc	actgaggata	tgaagatata	ccaagatgaa	atctttggac	cagtcatgtc	1260
actgatgaaa	ttcaagacgg	tagaggaagg	gatcaaatgc	gcaaacaaca	cgaaatacgg	1320
tcttgcagca	ggaatactaa	gccaagacat	agacttgatc	aacacggttt	cgaggtcaat	1380
caaagctgga	atcatttggg	ttaattgcta	cttcgggttt	gatcttgact	gtccttatgg	1440
33 3	atgagtggta	2 2 2	3 33 3			1500
	tccgtcgtta	-			,	1560
	gaaaaaaact	taatccaatg	ataataaggc	ggcttgaatt	aaaaaaaaa	1620
aaaaa						1625

<211> 1506

<212> DNA

<213> Arabidopsis thaliana

<400> 2

atggagaacg gcaaatgcaa cggagccacg acggtgaagt taccggagat caaattcacc aagcttttca tcaacggcca gttcattgat gctgcttcag ggaagacgtt tgagacgata 120 180 gaccctagga acggtgaagt gatcgcaaca atagccgaag gagacaaaga agacgttgac ttggccgtta acgctgcacg ttacgccttc gaccatggtc cttggcctcg catgaccggc 300 ttcgagaggg caaagcttat aaacaaattc gcagacttaa tagaggaaaa cattgaagaa ttggctaaac ttgatgcggt tgacggtgga aaattgttcc aattggggaa atatgctgat 360 attccggcca cagccggtca ttttcgatac aatgcgggtg cagcggataa aatccacggc 420 480 gagactetta aaatgacgeg teaategttg tttggataca eeeteaaaga accaattgga gtggttggta atatcatccc ttggaatttc ccaagcatta tgtttgccac aaaggtagct 540 ccggctatgg ctgctggttg caccatggtg gtcaagccag ctgaacagac ttcactctct 600 660 getttgttet atgeeeatet eteaaaagaa gegggaatte etgatggtgt geteaaeatt 720 gtaactggtt ttggatcaac tgctggagct gccattgcct cccatatgga cgtagacaaa 780 gttagtttca ctgggtcaac agatgttgga aggaagataa tgcaagccgc agccgcaagt 840 aatctcaaaa aagtttccct tgaattaggc gggaaatcgc cacttctcat attcaacgac

gctgatattg	acaaagccgc	cgatcttgcg	cttctcggtt	gcttttacaa	caagggtgaa	900
atttgcgtgg	cgagctctcg	tgtgtttgtt	caagaaggta	tatacgataa	ggttgtggag	960
aagttagtag	agaaggctaa	agattggacc	gttggtgatc	cttttgattc	cactgctcga	1020
caaggacctc	aagtggataa	aagacagttt	gagaagattc	tatcttacat	tgagcacggt	1080
aaaaacgaag	gagcgacctt	attaactgga	ggaaaagcca	ttggagacaa	aggatatttc	1140
atccaaccaa	ctatattcgc	agatgtcact	gaggatatga	agatatacca	agatgaaatc	1200
tttggaccag	tcatgtcact	gatgaaattc	aagacggtag	aggaagggat	caaatgcgca	1260
aacaacacga	aatacggtct	tgcagcagga	atactaagcc	aagacataga	cttgatcaac	1320
acggtttcga	ggtcaatcaa	agctggaatc	atttgggtta	attgctactt	cgggtttgat	1380
cttgactgtc	cttatggtgg	ctacaagatg	agtggtaatt	gtcgtgaaag	tggcatggac	1440
gctctcgaca	actatctaca	aaccaaatcc	gtcgttatgc	ctcttcacaa	ttccccttgg	1500
atgtaa						1506

<211> 501

<212> PRT

<213> Arabidopsis thaliana

<400> 3

Met Glu Asn Gly Lys Cys Asn Gly Ala Thr Thr Val Lys Leu Pro Glu 1 5 10 15

Ile Lys Phe Thr Lys Leu Phe Ile Asn Gly Gln Phe Ile Asp Ala Ala 20 25 30

Ser Gly Lys Thr Phe Glu Thr Ile Asp Pro Arg Asn Gly Glu Val Ile $35 \hspace{1.5cm} 40 \hspace{1.5cm} 45 \hspace{1.5cm}$

Ala Thr Ile Ala Glu Gly Asp Lys Glu Asp Val Asp Leu Ala Val Asn 50 55 60

Ala Ala Arg Tyr Ala Phe Asp His Gly Pro Trp Pro Arg Met Thr Gly 65 70 75 80

Phe Glu Arg Ala Lys Leu Ile Asn Lys Phe Ala Asp Leu Ile Glu Glu 85 90 95

Asn Ile Glu Glu Leu Ala Lys Leu Asp Ala Val Asp Gly Gly Lys Leu

100 105 110

Phe Gln Leu Gly Lys Tyr Ala Asp Ile Pro Ala Thr Ala Gly His Phe 115 120 125 Arg Tyr Asn Ala Gly Ala Ala Asp Lys Ile His Gly Glu Thr Leu Lys 135 140 Met Thr Arg Gln Ser Leu Phe Gly Tyr Thr Leu Lys Glu Pro Ile Gly 150 155 160 145 Val Val Gly Asn Ile Ile Pro Trp Asn Phe Pro Ser Ile Met Phe Ala 165 170 175 Thr Lys Val Ala Pro Ala Met Ala Gly Cys Thr Met Val Lys 180 185 190 Pro Ala Glu Gln Thr Ser Leu Ser Ala Leu Phe Tyr Ala His Leu Ser 195 200 205 Lys Glu Ala Gly Ile Pro Asp Gly Val Leu Asn Ile Val Thr Gly Phe 210 215 220 Gly Ser Thr Ala Gly Ala Ala Ile Ala Ser His Met Asp Val Asp Lys 225 230 235 240 Val Ser Phe Thr Gly Ser Thr Asp Val Gly Arg Lys Ile Met Gln Ala 250 245 255 Ala Ala Ser Asn Leu Lys Lys Val Ser Leu Glu Leu Gly Gly Lys 260 265 270 Ser Pro Leu Ile Phe Asn Asp Ala Asp Ile Asp Lys Ala Ala Asp 275 280 Leu Ala Leu Leu Gly Cys Phe Tyr Asn Lys Gly Glu Ile Cys Val Ala 290 295 300 Ser Ser Arg Val Phe Val Gln Glu Gly Ile Tyr Asp Lys Val Val Glu 310 315 320 305

Lys Leu Val Glu Lys Ala Lys Asp Trp Thr Val Gly Asp Pro Phe Asp

330

335

Ser	Thr	Ala	Arg 340	Gln	Gly	Pro	Gln	Val 345	Asp	Lys	Arg	Gln	Phe 350	Glu	Lys
Ile	Leu	Ser 355	Tyr	Ile	Glu	His	Gly 360	Lys	Asn	Glu	Gly	Ala 365	Thr	Leu	Leu
Thr	Gly 370	Gly	Lys	Ala	Ile	Gly 375	Asp	Lys	Gly	Tyr	Phe 380	Ile	Gln	Pro	Thr
Ile 385	Phe	Ala	Asp	Val	Thr 390	Glu	Asp	Met	Lys	Ile 395	Tyr	Gln	Asp	Glu	Ile 400
Phe	Gly	Pro	Val	Met 405	Ser	Leu	Met	Lys	Phe 410	Lys	Thr	Val	Glu	Glu 415	Gly
Ile	Lys	Суз	Ala 420	Asn	Asn	Thr	Lys	Tyr 425	Gly	Leu	Ala	Ala	Gly 430	Ile	Leu
Ser	Gln	Asp 435	Ile	Asp	Leu	Ile	Asn 440	Thr	Val	Ser	Arg	Ser 445	Ile	Lys	Ala
Gly	Ile 450	Ile	Trp	Val	Asn	Cys 455	Tyr	Phe	Gly	Phe	Asp 460	Leu	Asp	Суз	Pro
Tyr 465	Gly	Gly	Tyr	Lys	Met 470	Ser	Gly	Asn	Cys	Arg 475	Glu	Ser	Gly	Met	Asp 480
Ala	Leu	Asp	Asn	Tyr 485	Leu	Gln	Thr	Lys	Ser 490	Val	Val	Met	Pro	Leu 495	His
Asn	Ser	Pro	Trp 500	Met											
<210 <211 <212 <213	L> : 2> :I	4 1636 DNA Arab:	idops	sis t	:hal:	iana									
<400 atg		4 caa q	gaaga	agttt	c tt	cgct	gct	c tct	cgct	ctt	tcat	gtc	ctc (ctcac	cgttct
atct	tet	ctc 1	taga	aggca	at ga	aacaq	gagga	a gct	caaa	agat	acaç	gtaad	cct (egeto	getget

gtcgaaaaca ctattactcc accagtgaaa gttgaacaca cacagcttct aatcggtgga 180

agattcgttg	atgcagtgtc	aggaaaaact	ttccctactt	tggatccaag	aaatggagaa	240
gtgattgctc	aagtgtctga	aggtgatgca	gaagacgtga	accgcgcggt	tgcagctgca	300
cgaaaggctt	ttgatgaagg	accatggcct	aaaatgacag	cttatgagag	atcaaagata	360
ctgtttcgtt	tcgctgattt	aatcgagaaa	cataatgatg	agattgctgc	tcttgagact	420
tgggataatg	ggaaacctta	tgaacaatct	gctcaaattg	aagtaccaat	gcttgctagg	480
gtgttccggt	actatgctgg	ttgggcagac	aagatacatg	gaatgacaat	gccaggagat	540
ggtccacacc	atgtgcagac	cttacatgag	cctataggag	tcgctggaca	aatcatccca	600
tggaacttcc	ctcttctcat	gctttcttgg	aaacttggac	cagctttagc	ttgcggtaac	660
accgttgttc	tcaaaactgc	tgagcaaact	cctctatctg	ctcttcttgt	tgggaaacta	720
cttcatgagg	ctggacttcc	tgatggagtt	gtgaatatag	tttctggatt	tggggctact	780
gctggtgcag	ctatagctag	tcacatggac	gttgataagg	ttgctttcac	cgggtctact	840
gatgttggga	agattattct	tgagttagct	tcaaaaagca	accttaaggc	agtgactctt	900
gagcttggag	gaaagtcacc	attcattgta	tgtgaagatg	ctgatgtgga	tcaggccgtt	960
gagcttgcac	atttcgcttt	gttctttaac	cagggacaat	gttgttgtgc	tggttcgcgt	1020
acatttgtac	atgaacgtgt	gtatgatgag	tttgtagaga	aagctaaagc	tcgtgcactc	1080
aagcgaaatg	ttggagatcc	cttcaagtca	ggcattgagc	aaggtcccca	ggtagactca	1140
gagcaattca	acaaaatcct	gaagtacatc	aaacatggag	ttgaggctgg	agccacatta	1200
caagctggag	gtgacaggct	tggttccaag	ggttactaca	ttcaacctac	tgtcttctca	1260
gatgtgaaag	atgacatgct	catagcaaca	gacgagattt	tcgggccggt	tcaaaccata	1320
ctgaaattca	aggatettga	tgaggtgatt	gcaagggcca	acaactcaag	gtacggttta	1380
gctgctggag	tgttcacaca	gaatcttgac	acagcacacc	ggctgatgcg	agcactcaga	1440
gttgggactg	tttggatcaa	ctgttttgat	gtacttgatg	catcaattcc	atttggaggg	1500
tataagatga	gtggcattgg	tagagagaaa	ggtatctaca	gtctcaacaa	ttacttgcaa	1560
gtcaaggctg	ttgttacttc	cctcaagaac	cctgcctggc	tctaaaccat	accaggtggt	1620
tacacttatt	tctcga					1636

<210> 5

<211> 534

<212> PRT

<213> Arabidopsis thaliana

Met Ala Ser Arg Val Ser Ser Leu Leu Ser Arg Ser Phe Met Ser 10 15 Ser Ser Arg Ser Ile Phe Ser Leu Arg Gly Met Asn Arg Gly Ala Gln 20 25 30 Arg Tyr Ser Asn Leu Ala Ala Ala Val Glu Asn Thr Ile Thr Pro Pro 40 45 35 Val Lys Val Glu His Thr Gln Leu Leu Ile Gly Gly Arq Phe Val Asp 50 55 60 Ala Val Ser Gly Lys Thr Phe Pro Thr Leu Asp Pro Arg Asn Gly Glu 65 70 75 80 Val Ile Ala Gln Val Ser Glu Gly Asp Ala Glu Asp Val Asn Arg Ala 85 90 Val Ala Ala Arg Lys Ala Phe Asp Glu Gly Pro Trp Pro Lys Met 100 105 110 Thr Ala Tyr Glu Arg Ser Lys Ile Leu Phe Arg Phe Ala Asp Leu Ile 120 125 115 Glu Lys His Asn Asp Glu Ile Ala Ala Leu Glu Thr Trp Asp Asn Gly 130 135 140 Lys Pro Tyr Glu Gln Ser Ala Gln Ile Glu Val Pro Met Leu Ala Arg 145 150 155 160 Val Phe Arg Tyr Tyr Ala Gly Trp Ala Asp Lys Ile His Gly Met Thr 165 170 175 Met Pro Gly Asp Gly Pro His His Val Gln Thr Leu His Glu Pro Ile 180 185 190 Gly Val Ala Gly Gln Ile Ile Pro Trp Asn Phe Pro Leu Leu Met Leu

200

210 215 220

Ser Trp Lys Leu Gly Pro Ala Leu Ala Cys Gly Asn Thr Val Val Leu

205

Lys 225	Thr	Ala	Glu	Gln	Thr 230	Pro	Leu	Ser	Ala	Leu 235	Leu	Val	Gly	Lys	Leu 240
Leu	His	Glu	Ala	Gly 245	Leu	Pro	Asp	Gly	Val 250	Val	Asn	Ile	Val	Ser 255	Gly
Phe	Gly	Ala	Thr 260	Ala	Gly	Ala	Ala	Ile 265	Ala	Ser	His	Met	Asp 270	Val	Asp
Lys	Val	Ala 275	Phe	Thr	Gly	Ser	Thr 280	Asp	Val	Gly	Lys	Ile 285	Ile	Leu	Glu
Leu	Ala 290	Ser	Lys	Ser	Asn	Leu 295	Lys	Ala	Val	Thr	Leu 300	Glu	Leu	Gly	Gly
Lys 305	Ser	Pro	Phe	Ile	Val 310	Суз	Glu	Asp	Ala	Asp 315	Val	Asp	Gln	Ala	Val 320
Glu	Leu	Ala	His	Phe 325	Ala	Leu	Phe	Phe	Asn 330	Gln	Gly	Gln	Суз	Сув 335	Cys
Ala	Gly	Ser	Arg 340	Thr	Phe	Val	His	Glu 345	Arg	Val	Tyr	Asp	Glu 350	Phe	Val
Glu	Lys	Ala 355	Lys	Ala	Arg	Ala	Leu 360	Lys	Arg	Asn	Val	Gly 365	Asp	Pro	Phe
Lys	Ser 370	Gly	Ile	Glu	Gln	Gly 375	Pro	Gln	Val	Asp	Ser 380	Glu	Gln	Phe	Asn
Lys 385	Ile	Leu	Lys	Tyr	Ile 390	Lys	His	Gly	Val	Glu 395	Ala	Gly	Ala	Thr	Leu 400
Gln	Ala	Gly	Gly	Asp 405	Arg	Leu	Gly	Ser	Lys 410	Gly	Tyr	Tyr	Ile	Gln 415	Pro
Thr	Val	Phe	Ser 420	Asp	Val	Lys	Asp	Asp 425	Met	Leu	Ile	Ala	Thr 430	Asp	Glu
Ile	Phe	Gly 435	Pro	Val	Gln	Thr	Ile 440	Leu	Lys	Phe	Lys	Asp 445	Leu	Asp	Glu

Val Ile Ala Arg Ala Asn Asn Ser Arg Tyr Gly Leu Ala Ala Gly Val 450 455 460

Phe Thr Gln Asn Leu Asp Thr Ala His Arg Leu Met Arg Ala Leu Arg 465 470 475 480

Val Gly Thr Val Trp Ile Asn Cys Phe Asp Val Leu Asp Ala Ser Ile 485 490 495

Pro Phe Gly Gly Tyr Lys Met Ser Gly Ile Gly Arg Glu Lys Gly Ile 500 505 510

Tyr Ser Leu Asn Asn Tyr Leu Gln Val Lys Ala Val Val Thr Ser Leu 515 520 525

Lys Asn Pro Ala Trp Leu 530

<210> 6

<211> 1854

<212> DNA

<213> Arabidopsis thaliana

<400> 6

agaggaggag aattcgaaga ataaaagata agaactttga cgttttgaag cttaaagctt gaaacttgtt tcatccatgg cggctcgtag agtgtcttct cttttatctc gatctttttc 120 agetteetet eeettaetgt ttegttetea agggagaaat tgttacaatg gagggatett 180 aaggagattt ggaacctctt ctgctgctgc tgaggaaatc ataaacccat ctgttcaagt 240 ttctcacaca cagctcctca tcaatgggaa ctttgttgac tctgcttctg gtaagacgtt 300 tccgactctt gatccgagga caggcgaagt cattgctcat gtagctgaag gcgatgctga agatatcaat cgagctgtga aagctgcaag gacggccttt gatgaaggac cttggcctaa 420 aatgagtgct tatgaaaggt caagagtttt gttgaggttt gcagatttgg ttgagaaaca 480 cagcgaagag ctcgcgtctc tagagacatg ggacaatggc aagccttacc aacaatcctt 540 gaccgcagag attcccatgt ttgcaagatt gttccgttac tatgctggat gggcggataa 600 gattcatgga ctaacaattc cagctgatgg aaactatcaa gttcacacat tacatgaacc 660 gataggtgta gctggacaga tcataccgtg gaattttcca cttttgatgt ttgcttggaa 720 780 agttggtcct gctcttgctt gtggtaacac cattgtcctc aaaaccgctg agcaaacacc 840 tctcacqqct ttctatqctq qaaaqctttt ccttqaaqcq qqtcttcctc ctqqtqttct

gaatattgtt tc	gggattcg	gtgcaacagc	aggtgctgcc	ctcgcgagtc	atatggatgt	900
agacaagctt gc	ttttacag	gatcgactga	tacggggaaa	gttatacttg	gattggctgc	960
taacagcaat ct	taagcccg	taactctgga	acttggaggg	aaatcaccgt	tcatcgtatt	1020
cgaagatgct ga	tattgata	aagctgtaga	gcttgcacac	tttgccctct	tcttcaacca	1080
ggggcaatgt tg	ctgcgcgg	ggtctcggac	atttgttcat	gagaaagtgt	atgatgagtt	1140
tgttgagaaa tc	aaaggcac	gcgcattgaa	acgtgttgtt	ggtgatcctt	tcaggaaagg	1200
cattgaacag gg	tcctcaga	tcgatttgaa	gcaatttgag	aaagtgatga	agtacataaa	1260
gtcaggtatc ga	aagcaatg	ctactcttga	atgtggtggt	gatcagattg	gagacaaagg	1320
ttacttcatc ca	acctactg	tcttctctaa	tgttaaggat	gacatgctta	tcgctcaaga	1380
cgagattttc gg	tccagtcc	aatcgatctt	gaagttcagt	gatgtggatg	aggtgataaa	1440
gagggcgaac ga	gacgaagt	acgggctagc	ggcaggggtt	ttcacgaaga	atctggacac	1500
ggca						

SEQUENCE LISTING

<110>	Chapp	e Research le, Clint Ramesh	n Foundatior	n			
<120>	REF1	Modified F	Plants and E	Plant Seeds			
<130>	PRF-1	0329					
<140>	10556	014					
<141>	2007-	11-02					
<160>	47						
<170>	Paten	tIn versio	on 3.3				
<210>	1						
<211>	1625						
<212>	DNA						
<213>	Arabi	dopsis tha	aliana				
<400>	1						
ccacgco	gtcc g	agagagaga	gagagaatta	caaagaaaaa	taaatggaga	acggcaaatg	60
caacgga	agcc a	cgacggtga	agttaccgga	gatcaaattc	accaagcttt	tcatcaacgg	120
ccagtto	catt g	atgctgctt	cagggaagac	gtttgagacg	atagacccta	ggaacggtga	180
agtgato	cgca a	caatagccg	aaggagacaa	agaagacgtt	gacttggccg	ttaacgctgc	240
acgttac	egee t	tcgaccatg	gtccttggcc	tcgcatgacc	ggcttcgaga	gggcaaagct	300
tataaad	caaa t	tcgcagact	taatagagga	aaacattgaa	gaattggcta	aacttgatgc	360
ggttgad	eggt g	gaaaattgt	tccaattggg	gaaatatgct	gatattccgg	ccacagccgg	420
tcatttt	cga t	acaatgcgg	gtgcagcgga	taaaatccac	ggcgagactc	ttaaaatgac	480
gcgtcaa	atcg t	tgtttggat	acaccctcaa	agaaccaatt	ggagtggttg	gtaatatcat	540
cccttgo	gaat t	tcccaagca	ttatgtttgc	cacaaaggta	gctccggcta	tggctgctgg	600
ttgcaco	catg g	tggtcaagc	cagctgaaca	gacttcactc	tctgctttgt	tctatgccca	660
tctctca	aaaa g	aagcgggaa	ttcctgatgg	tgtgctcaac	attgtaactg	gttttggatc	720
aactgct	gga g	ctgccattg	cctcccatat	ggacgtagac	aaagttagtt	tcactgggtc	780
aacagat	igtt g	gaaggaaga	taatgcaagc	cgcagccgca	agtaatctca	aaaaagtttc	840
ccttgaa	atta g	gcgggaaat	cgccacttct	catattcaac	gacgctgata	ttgacaaagc	900
cgccgat	ctt g	cgcttctcg	gttgctttta	caacaagggt	gaaatttgcg	tggcgagctc	960

tcgtgtgttt gttcaagaag gtatatacga taaggttgtg gagaagttag tagagaaggc 1020

taaagattgg	accgttggtg	atccttttga	ttccactgct	cgacaaggac	ctcaagtgga	1080
taaaagacag	tttgagaaga	ttctatctta	cattgagcac	ggtaaaaacg	aaggagcgac	1140
cttattaact	ggaggaaaag	ccattggaga	caaaggatat	ttcatccaac	caactatatt	1200
cgcagatgtc	actgaggata	tgaagatata	ccaagatgaa	atctttggac	cagtcatgtc	1260
actgatgaaa	ttcaagacgg	tagaggaagg	gatcaaatgc	gcaaacaaca	cgaaatacgg	1320
tcttgcagca	ggaatactaa	gccaagacat	agacttgatc	aacacggttt	cgaggtcaat	1380
caaagctgga	atcatttggg	ttaattgcta	cttcgggttt	gatcttgact	gtccttatgg	1440
33 3	atgagtggta	2 2 2	3 33 3			1500
	tccgtcgtta	-			,	1560
	gaaaaaaact	taatccaatg	ataataaggc	ggcttgaatt	aaaaaaaaa	1620
aaaaa						1625

<211> 1506

<212> DNA

<213> Arabidopsis thaliana

<400> 2

atggagaacg gcaaatgcaa cggagccacg acggtgaagt taccggagat caaattcacc aagcttttca tcaacggcca gttcattgat gctgcttcag ggaagacgtt tgagacgata 120 180 gaccctagga acggtgaagt gatcgcaaca atagccgaag gagacaaaga agacgttgac ttggccgtta acgctgcacg ttacgccttc gaccatggtc cttggcctcg catgaccggc 300 ttcgagaggg caaagcttat aaacaaattc gcagacttaa tagaggaaaa cattgaagaa ttggctaaac ttgatgcggt tgacggtgga aaattgttcc aattggggaa atatgctgat 360 attccggcca cagccggtca ttttcgatac aatgcgggtg cagcggataa aatccacggc 420 480 gagactetta aaatgacgeg teaategttg tttggataca eeeteaaaga accaattgga gtggttggta atatcatccc ttggaatttc ccaagcatta tgtttgccac aaaggtagct 540 ccggctatgg ctgctggttg caccatggtg gtcaagccag ctgaacagac ttcactctct 600 660 getttgttet atgeeeatet eteaaaagaa gegggaatte etgatggtgt geteaaeatt 720 gtaactggtt ttggatcaac tgctggagct gccattgcct cccatatgga cgtagacaaa 780 gttagtttca ctgggtcaac agatgttgga aggaagataa tgcaagccgc agccgcaagt 840 aatctcaaaa aagtttccct tgaattaggc gggaaatcgc cacttctcat attcaacgac

gctgatattg	acaaagccgc	cgatcttgcg	cttctcggtt	gcttttacaa	caagggtgaa	900
atttgcgtgg	cgagctctcg	tgtgtttgtt	caagaaggta	tatacgataa	ggttgtggag	960
aagttagtag	agaaggctaa	agattggacc	gttggtgatc	cttttgattc	cactgctcga	1020
caaggacctc	aagtggataa	aagacagttt	gagaagattc	tatcttacat	tgagcacggt	1080
aaaaacgaag	gagcgacctt	attaactgga	ggaaaagcca	ttggagacaa	aggatatttc	1140
atccaaccaa	ctatattcgc	agatgtcact	gaggatatga	agatatacca	agatgaaatc	1200
tttggaccag	tcatgtcact	gatgaaattc	aagacggtag	aggaagggat	caaatgcgca	1260
aacaacacga	aatacggtct	tgcagcagga	atactaagcc	aagacataga	cttgatcaac	1320
acggtttcga	ggtcaatcaa	agctggaatc	atttgggtta	attgctactt	cgggtttgat	1380
cttgactgtc	cttatggtgg	ctacaagatg	agtggtaatt	gtcgtgaaag	tggcatggac	1440
gctctcgaca	actatctaca	aaccaaatcc	gtcgttatgc	ctcttcacaa	ttccccttgg	1500
atgtaa						1506

<211> 501

<212> PRT

<213> Arabidopsis thaliana

<400> 3

Met Glu Asn Gly Lys Cys Asn Gly Ala Thr Thr Val Lys Leu Pro Glu 1 5 10 15

Ile Lys Phe Thr Lys Leu Phe Ile Asn Gly Gln Phe Ile Asp Ala Ala 20 25 30

Ser Gly Lys Thr Phe Glu Thr Ile Asp Pro Arg Asn Gly Glu Val Ile $35 \hspace{1.5cm} 40 \hspace{1.5cm} 45 \hspace{1.5cm}$

Ala Thr Ile Ala Glu Gly Asp Lys Glu Asp Val Asp Leu Ala Val Asn 50 55 60

Ala Ala Arg Tyr Ala Phe Asp His Gly Pro Trp Pro Arg Met Thr Gly 65 70 75 80

Phe Glu Arg Ala Lys Leu Ile Asn Lys Phe Ala Asp Leu Ile Glu Glu 85 90 95

Asn Ile Glu Glu Leu Ala Lys Leu Asp Ala Val Asp Gly Gly Lys Leu

100 105 110

Phe Gln Leu Gly Lys Tyr Ala Asp Ile Pro Ala Thr Ala Gly His Phe 115 120 125 Arg Tyr Asn Ala Gly Ala Ala Asp Lys Ile His Gly Glu Thr Leu Lys 135 140 Met Thr Arg Gln Ser Leu Phe Gly Tyr Thr Leu Lys Glu Pro Ile Gly 150 155 160 145 Val Val Gly Asn Ile Ile Pro Trp Asn Phe Pro Ser Ile Met Phe Ala 165 170 175 Thr Lys Val Ala Pro Ala Met Ala Gly Cys Thr Met Val Lys 180 185 190 Pro Ala Glu Gln Thr Ser Leu Ser Ala Leu Phe Tyr Ala His Leu Ser 195 200 205 Lys Glu Ala Gly Ile Pro Asp Gly Val Leu Asn Ile Val Thr Gly Phe 210 215 220 Gly Ser Thr Ala Gly Ala Ala Ile Ala Ser His Met Asp Val Asp Lys 225 230 235 240 Val Ser Phe Thr Gly Ser Thr Asp Val Gly Arg Lys Ile Met Gln Ala 250 245 255 Ala Ala Ser Asn Leu Lys Lys Val Ser Leu Glu Leu Gly Gly Lys 260 265 270 Ser Pro Leu Ile Phe Asn Asp Ala Asp Ile Asp Lys Ala Ala Asp 275 280 Leu Ala Leu Leu Gly Cys Phe Tyr Asn Lys Gly Glu Ile Cys Val Ala 290 295 300 Ser Ser Arg Val Phe Val Gln Glu Gly Ile Tyr Asp Lys Val Val Glu 310 315 320 305

Lys Leu Val Glu Lys Ala Lys Asp Trp Thr Val Gly Asp Pro Phe Asp

330

335

Ser	Thr	Ala	Arg 340	Gln	Gly	Pro	Gln	Val 345	Asp	Lys	Arg	Gln	Phe 350	Glu	Lys
Ile	Leu	Ser 355	Tyr	Ile	Glu	His	Gly 360	Lys	Asn	Glu	Gly	Ala 365	Thr	Leu	Leu
Thr	Gly 370	Gly	Lys	Ala	Ile	Gly 375	Asp	Lys	Gly	Tyr	Phe 380	Ile	Gln	Pro	Thr
Ile 385	Phe	Ala	Asp	Val	Thr 390	Glu	Asp	Met	Lys	Ile 395	Tyr	Gln	Asp	Glu	Ile 400
Phe	Gly	Pro	Val	Met 405	Ser	Leu	Met	Lys	Phe 410	Lys	Thr	Val	Glu	Glu 415	Gly
Ile	Lys	Суз	Ala 420	Asn	Asn	Thr	Lys	Tyr 425	Gly	Leu	Ala	Ala	Gly 430	Ile	Leu
Ser	Gln	Asp 435	Ile	Asp	Leu	Ile	Asn 440	Thr	Val	Ser	Arg	Ser 445	Ile	Lys	Ala
Gly	Ile 450	Ile	Trp	Val	Asn	Cys 455	Tyr	Phe	Gly	Phe	Asp 460	Leu	Asp	Суз	Pro
Tyr 465	Gly	Gly	Tyr	Lys	Met 470	Ser	Gly	Asn	Cys	Arg 475	Glu	Ser	Gly	Met	Asp 480
Ala	Leu	Asp	Asn	Tyr 485	Leu	Gln	Thr	Lys	Ser 490	Val	Val	Met	Pro	Leu 495	His
Asn	Ser	Pro	Trp 500	Met											
	1> : 2> : 3> :		idops	sis t	:hal:	iana									
	-		-	-		_	-		_			-			getget

gtcgaaaaca ctattactcc accagtgaaa gttgaacaca cacagcttct aatcggtgga 180

agattcgttg	atgcagtgtc	aggaaaaact	ttccctactt	tggatccaag	aaatggagaa	240
gtgattgctc	aagtgtctga	aggtgatgca	gaagacgtga	accgcgcggt	tgcagctgca	300
cgaaaggctt	ttgatgaagg	accatggcct	aaaatgacag	cttatgagag	atcaaagata	360
ctgtttcgtt	tcgctgattt	aatcgagaaa	cataatgatg	agattgctgc	tcttgagact	420
tgggataatg	ggaaacctta	tgaacaatct	gctcaaattg	aagtaccaat	gcttgctagg	480
gtgttccggt	actatgctgg	ttgggcagac	aagatacatg	gaatgacaat	gccaggagat	540
ggtccacacc	atgtgcagac	cttacatgag	cctataggag	tcgctggaca	aatcatccca	600
tggaacttcc	ctcttctcat	gctttcttgg	aaacttggac	cagctttagc	ttgcggtaac	660
accgttgttc	tcaaaactgc	tgagcaaact	cctctatctg	ctcttcttgt	tgggaaacta	720
cttcatgagg	ctggacttcc	tgatggagtt	gtgaatatag	tttctggatt	tggggctact	780
gctggtgcag	ctatagctag	tcacatggac	gttgataagg	ttgctttcac	cgggtctact	840
gatgttggga	agattattct	tgagttagct	tcaaaaagca	accttaaggc	agtgactctt	900
gagcttggag	gaaagtcacc	attcattgta	tgtgaagatg	ctgatgtgga	tcaggccgtt	960
gagcttgcac	atttcgcttt	gttctttaac	cagggacaat	gttgttgtgc	tggttcgcgt	1020
acatttgtac	atgaacgtgt	gtatgatgag	tttgtagaga	aagctaaagc	tcgtgcactc	1080
aagcgaaatg	ttggagatcc	cttcaagtca	ggcattgagc	aaggtcccca	ggtagactca	1140
gagcaattca	acaaaatcct	gaagtacatc	aaacatggag	ttgaggctgg	agccacatta	1200
caagctggag	gtgacaggct	tggttccaag	ggttactaca	ttcaacctac	tgtcttctca	1260
gatgtgaaag	atgacatgct	catagcaaca	gacgagattt	tcgggccggt	tcaaaccata	1320
ctgaaattca	aggatettga	tgaggtgatt	gcaagggcca	acaactcaag	gtacggttta	1380
gctgctggag	tgttcacaca	gaatcttgac	acagcacacc	ggctgatgcg	agcactcaga	1440
gttgggactg	tttggatcaa	ctgttttgat	gtacttgatg	catcaattcc	atttggaggg	1500
tataagatga	gtggcattgg	tagagagaaa	ggtatctaca	gtctcaacaa	ttacttgcaa	1560
gtcaaggctg	ttgttacttc	cctcaagaac	cctgcctggc	tctaaaccat	accaggtggt	1620
tacacttatt	tctcga					1636

<210> 5

<211> 534

<212> PRT

<213> Arabidopsis thaliana

Met Ala Ser Arg Val Ser Ser Leu Leu Ser Arg Ser Phe Met Ser 10 15 Ser Ser Arg Ser Ile Phe Ser Leu Arg Gly Met Asn Arg Gly Ala Gln 20 25 30 Arg Tyr Ser Asn Leu Ala Ala Ala Val Glu Asn Thr Ile Thr Pro Pro 40 45 35 Val Lys Val Glu His Thr Gln Leu Leu Ile Gly Gly Arq Phe Val Asp 50 55 60 Ala Val Ser Gly Lys Thr Phe Pro Thr Leu Asp Pro Arg Asn Gly Glu 65 70 75 80 Val Ile Ala Gln Val Ser Glu Gly Asp Ala Glu Asp Val Asn Arg Ala 85 90 Val Ala Ala Arg Lys Ala Phe Asp Glu Gly Pro Trp Pro Lys Met 100 105 110 Thr Ala Tyr Glu Arg Ser Lys Ile Leu Phe Arg Phe Ala Asp Leu Ile 120 125 115 Glu Lys His Asn Asp Glu Ile Ala Ala Leu Glu Thr Trp Asp Asn Gly 130 135 140 Lys Pro Tyr Glu Gln Ser Ala Gln Ile Glu Val Pro Met Leu Ala Arg 145 150 155 160 Val Phe Arg Tyr Tyr Ala Gly Trp Ala Asp Lys Ile His Gly Met Thr 165 170 175 Met Pro Gly Asp Gly Pro His His Val Gln Thr Leu His Glu Pro Ile 180 185 190 Gly Val Ala Gly Gln Ile Ile Pro Trp Asn Phe Pro Leu Leu Met Leu

200

210 215 220

Ser Trp Lys Leu Gly Pro Ala Leu Ala Cys Gly Asn Thr Val Val Leu

205

Lys 225	Thr	Ala	Glu	Gln	Thr 230	Pro	Leu	Ser	Ala	Leu 235	Leu	Val	Gly	Lys	Leu 240
Leu	His	Glu	Ala	Gly 245	Leu	Pro	Asp	Gly	Val 250	Val	Asn	Ile	Val	Ser 255	Gly
Phe	Gly	Ala	Thr 260	Ala	Gly	Ala	Ala	Ile 265	Ala	Ser	His	Met	Asp 270	Val	Asp
Lys	Val	Ala 275	Phe	Thr	Gly	Ser	Thr 280	Asp	Val	Gly	Lys	Ile 285	Ile	Leu	Glu
Leu	Ala 290	Ser	Lys	Ser	Asn	Leu 295	Lys	Ala	Val	Thr	Leu 300	Glu	Leu	Gly	Gly
Lys 305	Ser	Pro	Phe	Ile	Val 310	Суз	Glu	Asp	Ala	Asp 315	Val	Asp	Gln	Ala	Val 320
Glu	Leu	Ala	His	Phe 325	Ala	Leu	Phe	Phe	Asn 330	Gln	Gly	Gln	Суз	Суs 335	Cys
Ala	Gly	Ser	Arg 340	Thr	Phe	Val	His	Glu 345	Arg	Val	Tyr	Asp	Glu 350	Phe	Val
Glu	Lys	Ala 355	Lys	Ala	Arg	Ala	Leu 360	Lys	Arg	Asn	Val	Gly 365	Asp	Pro	Phe
Lys	Ser 370	Gly	Ile	Glu	Gln	Gly 375	Pro	Gln	Val	Asp	Ser 380	Glu	Gln	Phe	Asn
Lys 385	Ile	Leu	Lys	Tyr	Ile 390	Lys	His	Gly	Val	Glu 395	Ala	Gly	Ala	Thr	Leu 400
Gln	Ala	Gly	Gly	Asp 405	Arg	Leu	Gly	Ser	Lys 410	Gly	Tyr	Tyr	Ile	Gln 415	Pro
Thr	Val	Phe	Ser 420	Asp	Val	Lys	Asp	Asp 425	Met	Leu	Ile	Ala	Thr 430	Asp	Glu
Ile	Phe	Gly 435	Pro	Val	Gln	Thr	Ile 440	Leu	Lys	Phe	Lys	Asp 445	Leu	Asp	Glu

Val Ile Ala Arg Ala Asn Asn Ser Arg Tyr Gly Leu Ala Ala Gly Val 450 455 460

Phe Thr Gln Asn Leu Asp Thr Ala His Arg Leu Met Arg Ala Leu Arg 465 470 475 480

Val Gly Thr Val Trp Ile Asn Cys Phe Asp Val Leu Asp Ala Ser Ile 485 490 495

Pro Phe Gly Gly Tyr Lys Met Ser Gly Ile Gly Arg Glu Lys Gly Ile 500 505 510

Tyr Ser Leu Asn Asn Tyr Leu Gln Val Lys Ala Val Val Thr Ser Leu 515 520 525

Lys Asn Pro Ala Trp Leu 530

<210> 6

<211> 1854

<212> DNA

<213> Arabidopsis thaliana

<400> 6

agaggaggag aattcgaaga ataaaagata agaactttga cgttttgaag cttaaagctt gaaacttgtt tcatccatgg cggctcgtag agtgtcttct cttttatctc gatctttttc 120 agetteetet eeettaetgt ttegttetea agggagaaat tgttacaatg gagggatett 180 aaggagattt ggaacctctt ctgctgctgc tgaggaaatc ataaacccat ctgttcaagt 240 ttctcacaca cagctcctca tcaatgggaa ctttgttgac tctgcttctg gtaagacgtt 300 tccgactctt gatccgagga caggcgaagt cattgctcat gtagctgaag gcgatgctga agatatcaat cgagctgtga aagctgcaag gacggccttt gatgaaggac cttggcctaa 420 aatgagtgct tatgaaaggt caagagtttt gttgaggttt gcagatttgg ttgagaaaca 480 cagcgaagag ctcgcgtctc tagagacatg ggacaatggc aagccttacc aacaatcctt 540 gaccgcagag attcccatgt ttgcaagatt gttccgttac tatgctggat gggcggataa 600 gattcatgga ctaacaattc cagctgatgg aaactatcaa gttcacacat tacatgaacc 660 gataggtgta gctggacaga tcataccgtg gaattttcca cttttgatgt ttgcttggaa 720 780 agttggtcct gctcttgctt gtggtaacac cattgtcctc aaaaccgctg agcaaacacc 840 tctcacqqct ttctatqctq qaaaqctttt ccttqaaqcq qqtcttcctc ctqqtqttct

gaatattgtt tc	gggattcg	gtgcaacagc	aggtgctgcc	ctcgcgagtc	atatggatgt	900
agacaagctt gc	ttttacag	gatcgactga	tacggggaaa	gttatacttg	gattggctgc	960
taacagcaat ct	taagcccg	taactctgga	acttggaggg	aaatcaccgt	tcatcgtatt	1020
cgaagatgct ga	tattgata	aagctgtaga	gcttgcacac	tttgccctct	tcttcaacca	1080
ggggcaatgt tg	ctgcgcgg	ggtctcggac	atttgttcat	gagaaagtgt	atgatgagtt	1140
tgttgagaaa tc	aaaggcac	gcgcattgaa	acgtgttgtt	ggtgatcctt	tcaggaaagg	1200
cattgaacag gg	tcctcaga	tcgatttgaa	gcaatttgag	aaagtgatga	agtacataaa	1260
gtcaggtatc ga	aagcaatg	ctactcttga	atgtggtggt	gatcagattg	gagacaaagg	1320
ttacttcatc ca	acctactg	tcttctctaa	tgttaaggat	gacatgctta	tcgctcaaga	1380
cgagattttc gg	tccagtcc	aatcgatctt	gaagttcagt	gatgtggatg	aggtgataaa	1440
gagggcgaac ga	gacgaagt	acgggctagc	ggcaggggtt	ttcacgaaga	atctggacac	1500
ggca						